

REMARKS

Claims 2-56 are in this application. Claim 5 has been amended to depend from claim 52. Claim 52 has been amended as described below. Claims 34-51 are withdrawn. It is noted that the Examiner states that claims 14 and 30 would be allowable if rewritten in independent form.

A request for continued examination accompanies this response. If any fees are due, they may be charged to deposit account 12-0425.

Claim 52 has been amended to include that "the insulation-material base body comprises insulation material selected from the group consisting of epoxy resin, polyimide, polyethylene naphthate, polyester or polyether etherketone". Support for this amendment is found on page 13 and page 20, second paragraph of the specification. This is another feature of the claimed invention that is clearly distinguished from the glass substrate 81 of Izumi (US 2002/0123176 A).

In addition, claim 52 has been amended to include that the contact layer is physically or chemically adsorbed directly on the surface of the base electrode. This feature also clearly distinguishes the claimed invention from Izumi, particularly the feature of contact layer 86.

Claim 52 also includes that "the contact layer is arranged to passivate the conductor

layer, and the contact layer further constitutes an electric contact-promoting layer and an adhesion-improving layer for enhancing the electric contact between the conductor layer and the thin film component and for stabilizing the adherence of the thin film component on the conductor layer, respectively." This feature is described on page 3 of the description.

According to the Office Action, claims 52, 4, 5, 8-9, 12-13 and 53-55 are rejected under 35 USC 103 (a) over the combination of Izumi (US20020123176) and Abe (US20030218153). This is respectfully traversed.

US 200210123176 (Izumi et al.) teaches a multi-layered structure which relies on glass or the like as an insulating substrate (see paragraph [0155] of Izumi). As discussed on page 2 of the description of the subject application, an insulating body made of glass has the disadvantage of being complex and expensive to produce and is less suitable for mounting electronic components thereon. As explained in the specification, there is a need for an easy-to-produce and cost-effective thin-film assembly which does not require nor use glass substrates.

According to the present invention there are circuit boards comprising an insulator body coated with smoothed conductor layers as a basis for thin-film assemblies. The insulator body is made of a resin material - here selected from the alternatives listed in amended claim 52, i.e. epoxy resin or the like. These materials for the insulator body are not disclosed in Izumi which specifically refers to glass substrates.

Furthermore, it is not clear if printed circuit boards are considered as substrates in Izumi at all; circuit boards are merely mentioned in the description of the general background of the invention (see paragraph [0001] of Izumi), whereas throughout the description of the embodiments reference is made solely to glass substrates or the like. It would thus be merely speculative to assume that Izumi teaches the use of conventional printed circuit boards as a basis for thin film arrangements. In any case, Izumi is completely silent about the structure of these circuit boards, in particular, Izumi contains no further information about the material used for the insulating body which in the present case is epoxy resin or the like, a material quite different from glass. Regardless of whether Izumi discloses circuit boards as potential substrates, it is emphasized that the teachings of Izumi are by no means sufficient to allow for the use of conventional circuit boards as a basis for thin film assemblies, as these classic circuit boards are per se not compatible with thin-film technologies. Special modifications of the circuit boards are required, in particular it is a novel technique of the present invention to smooth the metal conductor layer so as to obtain a low surface roughness. Only by this measure, are the circuit boards suitable to serve as a basis for thin films. Izumi clearly fails to disclose these features. Modifying the per se conventional circuit boards by smoothing the metal coatings is not obvious in view of the teachings of Izumi. The glass substrates described in Izumi are per se smooth without further modifications so that smoothing the surface of the glass bodies would not be contemplated by a person skilled in the art. Accordingly, the surface of the ITO film applied on the glass substrate according to fig. 5a of Izumi, is per se smooth. Thus, the design of this ITO film provides no suggestion whatsoever at smoothing the per se rough surfaces of conventional circuit boards.

It is further emphasized that the circuit boards provided for in the present invention must be treated as single structural parts when comparing with the prior art, as they typically present ready-made assemblies. The use of circuit boards with smoothed surfaces can not be anticipated by the teachings of Izumi further in view of Abe et al. (US20030218153).

Abe discloses a transparent conductor layer (see paragraph [0036] of Abe) with a per se smooth surface, i.e. with a surface roughness of 2.5nm or less. However, this transparent conductor layer is certainly not equivalent to the conductor layer of the present invention, as it does not constitute the metal coating of conventional circuit boards which are not disclosed nor suggested as potential substrates in Abe. Moreover, as has previously been pointed out, the thin conducting layer according to Abe forms the upper electrode which serves a very different purpose, namely to ensure the transparency or translucence of the shown assembly. Contrary to this, in the claimed invention, the smoothed conductor layer on the resin substrate forms the basis for the thin film structure. The present invention concerns the modification of conventional, ready-made circuit boards by smoothing the conductor layers coating the insulating body, wherein the metal coatings are an integral part thereof.

The present invention is further distinguished from the prior art by providing for a specific design and functionality of the contact layer arranged between the base electrode and the thin-film components; claim 52 has been amended in order to reflect the multiple purposes of this contact layer and to stress its position in the multi-layer assembly. According to the present invention, the contact layer is applied to the conductor

layer which has previously been smoothed in order to attain a low surface roughness and thus being adapted to serve as a basis for the contact layer. By providing for such a contact layer, the penetration of substances from the insulating body into the thin-film components can be prevented; a first purpose of the contact layer thus lies in passivating the conductor layer. Furthermore, the contact layer enhances the electric contact between the thin-film layers and the conductor layer. Thirdly, the contact layer stabilizes the adherence of the thin-film assembly on the conductor layer. While the contact layer according to the present invention is applied directly to the conductor layer, the contact layer shown in Izumi is in a position spaced from the conductor layer (cf. gate electrode with reference numeral 83 in fig. 6 of Izumi) by a gate insulating film and a channel layer. Hence, it becomes evident that this contact layer could by no means attain the effects of passivation, enhancement of both electric contact and adherence between the conductor layer and the thin-film component, as is the case in the present assembly in order to make use of conventional circuit board as substrates. Since the contact layer in Izumi serves a very different purpose, namely to effectuate the contact between the channel layer and a source electrode, the present contact layer cannot be suggested by Izumi.

Therefore, it is respectfully requested that this rejection be withdrawn.

As all of the other rejections relate to claims that depend directly or indirectly from independent claim 52 and are based on the combination of at least Izumi and Abe, based on the arguments presented above, the remaining claims are not obvious.

Therefore, it is respectfully requested that these rejections be withdrawn and these claims be allowed.

It is submitted that the application is in condition for allowance and favorable consideration is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Janet I. Cord', written over a horizontal line.

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